Invisible Messages

Kit contains:

- 2 hand sanitizer packets
- 1 tablespoon baking soda
- ½ teaspoon turmeric
- 1 cotton ball
- 1 Q-tip
- 1 craft stick

You will need: a measuring cup, water, a spoon, paper, a non-staining plate, and mess containment supplies.

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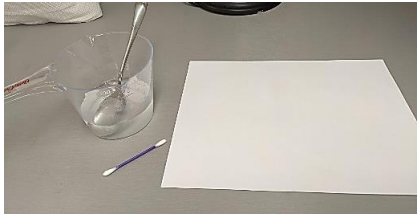
INSTRUCTIONS



Step 1. Stir the baking soda into ½ cup of warm water.

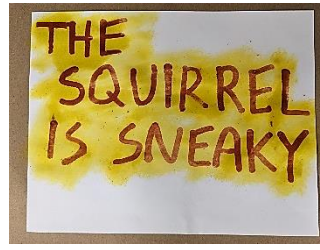
Step 2. Use the Q-tip to write a message on paper with the baking soda solution. (**Note:** If the baking soda settles at the bottom of the cup, stir it again.)

Step 3. Wait for your paper to dry completely. The message will disappear.

Step 4. Mix the turmeric and hand sanitizer together on a non-staining plate using the craft stick.

Mess Containment: Turmeric dyes stuff yellow, but you can prevent a mess. Plan ahead! Put scrap paper below your project. Clear the route between turmeric-mixing supplies and the trash.

Step 5. Dip the cotton ball into the turmeric mixture and wipe it across the now-blank paper. Your invisible message will appear!



WHAT'S GOING ON?

In chemistry, we describe substances as **acids** or **bases**. Acids have lots of **hydrogen ions**. Bases have lots of **hydroxide ions**. Turmeric is a natural pH indicator. It contains a chemical called curcumin that stays yellow in an acidic or neutral solution but turns red-brown in a base. Observe the turmeric's reaction with your invisible message. Is baking soda an acid or a base?

(turmeric: flowering plant, roots, and ground root)

HISTORY CONNECTION

Invisible ink played an important role during the American Revolution (1775–1783). It was a spy tool used for secret communication by both the revolutionaries and the British.

The British used two types of invisible inks: those that revealed their secrets when exposed to an acid, and those that reappeared with heat. British intelligence agents would write “A” for acid or “F” for flame in the corners of messages as a clue.

George Washington wanted an ink that could not be read when exposed to heat. Dr. James Jay created a method in which invisible messages were written with one chemical and revealed with a second. Washington encouraged the American spies to write their secret messages in the margins of regular books for extra sneakiness.

Sources: researchparent.com/color-changing-invisible-ink/ mountvernon.org/education/online-activities-for-kids-2/ how-to-make-invisible-ink/